THE AQUATIC FAUNA OF KING ISLAND'S STREAMS AND WETLANDS

PETER DAVIES, KATE BROWN, TOM SLOANE, RODNEY WALKER, LAURIE COOK.

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Introduction

King Island has a wide range of freshwater aquatic environments including rivers and streams and ephemeral and permanent wetlands (ponds, swamps, lagoons). The fauna of these environments is not well known, and the writing of this chapter required some new sampling to be done. As a result we now know that the island has many species (more than 140) of aquatic macroinvertebrates, including burrowing crayfish, aquatic insects, freshwater crabs and snails, as well as eight species of freshwater fish.

The island is highly seasonal in its rainfall, and, as a consequence most of the streams and rivers have very low or no flow during the summer and autumn months. Some sections have permanent water, especially near the coast or those associated with springs or escarpments.

The landscape of the island has changed substantially since European settlement, and significant changes have occurred to its freshwater habitats. Most of the catchments no longer have their original vegetation cover, and that, coupled with intensive agriculture, has undoubtedly led to changes in stream flows and water quality. Changes to the bankside or riparian vegetation have been significant, with many stream sections and wetlands now having no or limited areas of natural riparian vegetation (1), and with many of these areas being accessed by stock, with effects on bank erosion and water quality. There is evidence of higher levels of turbidity, nutrients and salinity in several streams, as well as in some wetlands (2, K Brown unpub data).

Before European settlement, most of the streams on the island were swamp-channel complexes with shallow channels containing large amounts of woody and other organic matter, often overlying sands. They were heavily shaded, slow flowing (except for in the south east) and many sections probably experienced seasonal (summer) drops in dissolved oxygen levels due to decomposition of organic material, during periods of slow flow and higher temperatures. In some cases, surface waters in swamps and lagoons and some stream sections were probably devoid of oxygen and contained hydrogen sulphide (rotten egg gas). This can be seen today in places like Collier's Swamp. Overall though, water quality was probably better than today, and stream habitats were more uniform across the island.

Despite these changes and the highly seasonal rainfall, the majority of streams and wetlands on the island still manage to maintain a reasonably diverse fauna, which in many cases is highly abundant.

Streams

The physical form of King Island streams was studied recently (3) and this has revealed that:

- rivers on the island are divided into five broad types, each with a characteristic form – rivers on flat landscape surfaces, on escarpments on the edge of these surfaces, in the dunefields of the west and east coasts, and on the younger northern plains.
- these regions are not determined by geology or by climate (which is fairly uniform over the island), but rather by the long term history of changes from wind action and sea-level;
- the presence of native riparian (bankside) vegetation in good condition is a key factor in determining the form and stability of river environments on King Island.

Wetlands

There are many wetlands on the island, varying in size from small ponds and ephemeral swamps to large 'lakes' and estuarine shallows with permanent water. The island was typified by having many swampy habitats when first settled, and the number and condition of these has declined significantly over the last century. The condition of wetlands is determined by:

- changes to (eg clearing) and management (eg burning) of surrounding vegetation;
- changes to drainage, inflows and outflows;
- management of levels through damming, draining, levees or roads;
- changes to water quality from local or upstream erosion, increased nutrient loads for pasture development;
- introduction of exotic species such as plants (eg *Typha*) and animals (eg trout).

Many or all of these things have been experienced by the wetlands on the island. In addition, large numbers of farm dams represent new habitat created since settlement, especially during the last 50 years. Examples of the wetlands in different disturbance categories are shown in Table 1.

Table 1. Wetland experiencing different degrees of disturbance on King Island.

Disturbance Category	Description	Wetland Examples
1	Intact marginal vegetation, no sign of drainage, immediate catchment still with substantial vegetation cover.	**Lily and Swan Lagoons the Nook Swamps, Colliers Swamp.**
2	Disturbed margin veg and/or some drainage, and/or immediate catchment with moderate degree of veg cover and/or some evidence of sediment input from local/catchment erosion and/or water quality impacts.	**Bertie Lagoon** - (vegetation burnt in 2001 fire)
3	Heavily disturbed marginal veg or marginal veg absent, and/or wetland severely drained or physically altered, and/or limited natural vegetation cover in catchment; significant evidence of sediment input from local/catchment erosion and/or water quality impacts.	**Pearshape and Tathams Lagoons** - limited marginal vegetation, heavy disturbance, sedimentation and water quality impacts.
4	No marginal vegetation (other than grasses or weeds), and/or completely altered physically and/or no natural vegetation in immediate catchment, and/or severe disturbance from erosion and/or other water quality changes	**Bob's Lagoon** - minimal marginal vegetation. Fenced for a few years, now a macrophyte dominated wetland, receiving agricultural runoff.

The Fauna

Fish

There are eight freshwater fish species on King Island, all of which are considered common to south-eastern Australian mainland and Tasmania. Six of these are native to the island and two (brown trout and rainbow trout) have been introduced as recreational fishing species. The native freshwater fish fauna consists of species that have a marine dispersal stage or have a high tolerance to salt. The trout species have been introduced for recreational fishing, and their effects on the native fauna is unknown, but probably limited.

It is unlikely that trout will establish significant self-sustaining populations on the island. Considerable care must be taken in future translocations (stockings) from mainland Tasmania to ensure that redfin perch and mosquito-fish are not also accidentally translocated. These pest species could establish major populations in the habitats on King Island and have a significant impact on the existing native fish and macroinvertebrate fauna.

All of the native species except the Southern Pygmy Perch (*Nannoperca australis*) spawn in marine areas and the resulting juveniles disperse widely in estuaries and/or local coastal waters prior to re-entering freshwater. The Southern Pygmy Perch is a land-locked species, but has a high tolerance to salt.

A recent survey conducted by the Inland Fisheries Service revealed that most of the freshwater habitat on King Island is degraded. The larger nature reserves (eg Lavinia) could sustain a diversity of fish species. The fish fauna in these areas is probably close to that which occurred throughout the island prior to European settlement.

More detail on individual fish species characteristics and status on King Island is contained in the descriptions below.

Crayfish

Two species of freshwater crayfish are known from King Island – *Geocharax gracilis* and *Engaeus cunicularius*. Both of these species are widespread on the island. They live in burrows, though *G. gracilis* can also be seen in open water in streams and wetlands. *Engaeus* burrows are found around the margins of swamps and wetlands and along river banks. *Geocharax* is also found in these habitats, but is also more widely distributed across field and heathy plains, often with very deep burrows. Both of these species are widespread, and occur in both northern Tasmania and Victoria. *E. cunicularius* is also found in north eastern Tasmania and Flinders Island. Both species build ‘chimneys’ at the entrance to their burrows, and those of *Geocharax* can be quite a site when scattered over paddocks (or even golfcourses!).

Macroinvertebrates

There is a wide variety of macroinvertebrates in the streams and wetlands of the island. Macroinvertebrates are small invertebrates that are typically caught by net,

visible to the naked eye, and range in size from around 0.25 mm to 10 cm. They include a variety of forms – aquatic insects, molluscs, crustaceans, worms and many species. They represent the core of animal diversity in freshwater environments. In sampling conducted for this guide from ten rivers or creeks and seven wetlands in 2002, 140 different forms (or 'taxa') of macroinvertebrates were identified, many of these being families or orders with many species yet to be identified or described. This represents between 200 and 300 species of macroinvertebrates from those waters alone. The species found are listed in Table 2.

Macroinvertebrate communities are strongly dependent on the type of habitat as well as the condition of the stream or wetland.

Macroinvertebrates in the streams

A wide variety of macroinvertebrates are found in the streams, with their communities strongly related to the degree of human disturbance or development in the catchment. Streams on the island can be classed as being in good to moderate, moderate to poor, and poor too very poor condition. These three classes of streams have distinct differences in their macroinvertebrate community composition.

Streams which are considered to be in good to moderate condition are: Seal River, Fraser River, Pass Creek, Sea Elephant River. Species with higher abundances in these better condition streams are as follows:

- The leptophlebiid mayfly *Nousia* species AV8.
- The stoneflies of the family Grypopyterygidae - *Dinotoperla serricaudata*, *Leptoperla varia*, *Riekoperla triloba regalis*, all of which are 'shredders' feeding on organic material such as twigs and leaves.
- The leptocerid caddisflies *Notalina spira* which builds its case from leaves, *Triplectides proximus* which builds its cases from hollowed out twigs (often with a twig 'rudder') in reaches with dense Melaleuca or ti-tree riparian forest, and *Triplectidina nigricornis*.
- The conoesucid caddisfly *Lingora aurata*, with a sand grain case.
- The sphaerid bivalve or pea-shell, *Pisidium casertanum*..
- The freshwater false spider crab *Amarinus lacustris*.

Streams currently considered as in moderate to poor condition are: Seal River, Ettrick River, Grassy River and Yarra Creek. Streams classified as in poor to very poor condition are include Yellow Rock River, Porky's Creek and Egg Lagoon Creek. Species which increase in abundance as stream catchments are developed and riparian zones are degraded or cleared are:

- The amphipods (scud) *Austrochiltonia dalhousiensi* and *Austrochiltonia australis*.
- The freshwater isopod *Heterias pusilla*.
- The planorbid snail *Glyptophysa gibbosa*.
- The seed shrimp or Ostracods, common to slow flowing and silty or plant dominated habitats in King Island streams.
- The leptocerid caddis *Symphitoneuria opposita*, associated with aquatic plants on unshaded channel edges.
- The native freshwater hydrobiid snails *Phrantela* and/or *Beddomia* (genera with potentially new species unique to the island), which favour slower flowing, plant-dominated backwaters.

Much of this response is due to changes in the nutrient, sediment, salinity and light regime of the streams. Catchment development tends to be associated with increased channelisation of the streams, along with large amounts of fine sediment lying in and moving through the channel, plus increased salinity. Increases in nutrient levels may occur but have little effect until light levels increase. Once riparian vegetation is opened up, or removed, increased light allows extensive growth of aquatic plants (such as pondweed, watercress or *Triglochin*), mainly along the channel margins, but occasionally across the entire channel (downstream reaches of Yellow Rock River), which can take advantage of enhanced sediment and nutrient loads in cleared catchments.

Thus, catchment development causes a shift from:

1. well shaded, shallow, sometimes braided channels containing large amounts of woody material, twigs and leaves –
   with a fauna dominated by leptocerid caddis (which build cases from bark, twigs and leaves) and grypopterygid stoneflies which 'shred' wood and leaf material as a food source;

to

2. open, deeper or more channelised sections with less woody material (organic carbon), more silt and areas of aquatic plants, sometimes coupled with higher salinity –
   with a fauna dominated by plant and slower flow loving species like planorbid snails, hydrophilid beetles, amphipods, isopods and ostracods.

Potamopyrgus antipodarum, an introduced New Zealand hydrobiid snail (common to many agricultural catchments in SE Australia and Tasmania) was found to occur in all the streams sampled, with the exception of Seal and Fraser Rivers. This suggests that these are the least disturbed rivers sampled on the island, since infestation with *P. antipodarum* is generally linked with multiple human disturbance. It was particularly abundant in the highly degraded and channelised Egg Lagoon Creek. This species is a small, brown water snail with a relatively pointy spire. It often has delicate teeth-like features on its shell, but these may often be absent. The females of this species carry their embryos in a small pouch under the shell, a characteristic feature seen when a specimen is squeezed between the fingers.

Species in mid-channel habitats which indicate low levels of catchment and riparian disturbance are the stoneflies *Leptoperla varia, Dinotoperla serricaudata* and *Riekoperla triloba regalis* (all of the family Grypopterygidae). These two species are much more abundant in less disturbed streams with intact riparian vegetation and low levels of catchment disturbance. They can be regarded as 'target species' for stream rehabilitation on King Island, and are mainly associated with high levels of organic debris (eg melaleuca and ti-tree leaves, twigs and branches). *D serricaudata* is more abundant in good condition edge habitats, while *R. triloba regalis* is more abundant in channel habitats of good condition streams.

These stoneflies have a winged adult stage and an aquatic nymph stage which look similar, though the latter have wing pads on their backs. Slow moving, drab (grey-brown) in colour and frequently small (5 – 10 mm long), the nymphs can be readily found crawling on sticks or rocks in good conditioned streams. They are easily

distinguished by the presence of two short 'tails' or cerci protruding from the tip of tjeir abdomen, with a bunch of short tufts between them which are their gills. When picked up (in water!) they often wag their tails to and fro in order to maintain their oxygen supply. As adults they are brown-grey often found crawling on bankside vegetation or logs, with straight wings folded neatly over the body and long antennae. They are poor fliers.

Adults of the Hydrophilid water scavenger beetle *Limnoxenus zelandicus,* and the planorbid snail *Glyptophysa gibbosa* are indicative of high levels of disturbance in King Island streams when found in abundance in stream edge habitats. The adults favour slow moving water and are herbivorous on aquatic plants. They are more abundant in streams that have little or no riparian vegetation, often with abundant aquatic plants along the edges, or in streams where the majority of the upstream drainage has been channelised. These streams often have higher salinity levels.

Limnoxenus is an oval beetle, up to 1 cm long as an adult. It looks black, but under strong light is actually bright green. It has large, silvery areas on its underside which are the air bubbles trapped on hairs that act as a bubble lung or *plastron*. Unlike many diving beetles, it swims with all of its legs, in a frantic action. The adults eat algae and water plant material. As a larva it is a predator on aquatic snails, which abound in the habitats it favours on King Island. The larvae have symmetrical mandibles with three teeth. The species is common in south-east Australia, and is capable of coping with its habitat drying up in summer. It usually stays put until near dry conditions when it disperses by lying. The adults are strong fliers and can seek out other wet areas to colonise.

The planorbid snail *Glyptophysa gibbosa* is a mid-sized snail (typically 0.5 to 1.5 cm long on King Island) snail which occupies slow flowing areas or stream edges with lots of plants. It feeds on algae and plant material and organic detritus. It has a fairly plain spiral shell, brown to brown black in colour. Like many snails it is hermaphrodite and capable of self-fertilising. In productive environments in SE Australia it is capable of reproducing between one and three times every year, and can have very high population densities (up to several thousand per square meter).

Macroinvertebrates of the wetlands

71 taxa were recorded from the survey of seven wetlands in 2002. In contrast to the streams, each wetland on King Island has its own distinctive faunal community, which seems to bear little or no relationship with the condition of the wetlands. The species found in the seven wetlands surveyed are shown in Table 3. The faunal community in these wetlands is strongly dependent on the aquatic vegetation, which are in turn dependent on water regime and quality and light conditions.

Differences in the fauna between the wetlands are quite marked. For example, the amphipod (or scud) *Austrochiltonia australis* dominates in all the wetlands surveyed except for Bobs Lagoon and Colliers Swamp in which it is either absent or very scarce, and in Pearshape Lagoon where the closely related *Austrochiltonia dalhousiensis* dominates. Chironomids (midges) are ubiquitous but are markedly dominant in Colliers Swamp, reflecting the occurrence of stagnant conditions with low oxygen and hydrogen sulphide.

Table 2. Macroinvertebrates recorded from streams on King Island. XXX, XX and X = taxon represents > 50%, 25% or 10% of total abundance. Data from winter 2002 kick net samples (live picked) from mid channel and edge habitats.

			Stream :	Seal R			Fraser R		Yellow Rock R		Pass R		Porky ck		Ettrick R	Grassy R	Sea Elephant R		Yarra Ck		Egg Lagoon Ck	
			Habitat :	Edge	Mid	Wood	Edge	Mid	Mid	Edge	Mid	Edge	Edge	Mid	Mid	Mid	Edge	Mid	Mid	Edge	Mid	Edge
Class	Order	Family	Species																			
Mollusca	Gastropoda	Hydrobiidae	*Potamopyrgus antipodarum*						X	X	X	XX	X	X	X	X		X			XX	XX
			Phrantela/Beddomia sp						X	X		X		X	XX							
		Ancylidae	*Ferrissia tasmanica*												X							
		Planorbidae	*Glyptophysa gibbosa*							XX		X	X	X	X						X	X
		Lymnaeidae	*lymnaea stagnalis*											X								
		Physidae	*Physa acuta*																			
	Platyhelminthes																					
	Oligochaeta			X	X	X	X	XX	XX	X	X	X		X	X	XX	XX		XX	XX	X	
	Bivalvia	Sphaeriidae	*Pisidium casertanum*		X						X			X	X				X			
			Spharium tasmanicum																			
Crustaceae	Cladocera	Daphniidae	*Daphnia sp.*																			
			Scapholerebris kingi																			
			Simocephalus sp.										X									
		Chydoridae																	X			
	Ostracoda								XX										XX	X	X	X
	Copepoda				X	X																
	Amphipoda	Ceinidae	*Austrochiltonia dalhousiensis*			X							XX	XX							XX	XX
			Austrochiltonia australis	X	X		X	X	XX	XX		X	X	XX	X	X			XX	XX		X
			Unidentified						X	X												
		Paramelitidae	Unidentified blind species		X					X	X	X	XX	X	X	XX						X
		Paracalliopidae	*Paracalliope vicinus*	XX	X					X	X	XX		X	X							
	Isopoda	Phreatoicidae													X							
		Janiridae	*Heterias sp.*	X	X	X			X			X	X	X							XX	XX
	Syncarida	Koonungidae	*Koonunga sp.*							X												
	Decapoda	Atyidae	*Parataya australiensis*														X	X				
		Hymenosomatidae	*Amarinus lacustris*								X	X			X		X	X			X	
		Parastacidae	*Geocharax gracilis*						X	X				X								
			Unidentified														X	X			X	
	Hydracarina	Astigmatidae							X	X												
		Elyidae		X	X					X			X							X		
		Hygrobatidae		X	X	X																
		Trombidoidea			X																X	
		Hydryphantidae																				
		Pezidae																				
		Oxidae																X				
		Pionid																	X			
		Unid												X	X							
		Lycosid spiders											X									X
	Collembola	Hypogasturidae		X																		
Insecta	Plecoptera	Gripopterygidae	*Cardioperla incerta*												X							
			Dinotoperla serricaudata				XX		X	X	XX	X			X	X	X					
			Dinotoperla opposita									X			X							
			Illesoperla mayi		X		X	X			X				X							
			Leptoperla varia	XX	XX		XX	X	X	X		X			X		X	X				
			Riekoperla triloba regalis		XX		X	X		X					X	X		XX				
		Notonemouridae	*Austrocerca tasmanica*										X	X		X						
			Kimminsoperla albomacula						X	X												
	Ephemeroptera	Leptophlebiidae	*Nousia sp av8*								XX	X			X							
			Nousia sp av7		X																	
			Nousia sp.					X							X							
	Odonata	Aeshnidae	*Aeshna brevistyla*										X									X
		Coenagrionidae	*Ischnura heterosticta tasmanica*										X	X								
			Ischnura aurora aurora																			X
		Lestidae	*Austrolestes analis*						X													
			Austrolestes annulosus							X			X	X								
			Austrolestes psyche		X								X	X								
	Hemiptera	Corixiidae	*Sigara australis*							X			X									
			Sigara neboissi																			
			Agraptocorixa eurynome												X					X		
			Micronecta annae tasmanica																	X		
			Unidentified						X													
		Notonectidae	*Anisops deani*												X					X		
			Anisops tasmaniensis																			
		Naucoridae	*Naucoris congrex*							X												
		Veliidae	*Microvelia oceana*												X							
			Microvelia peramoena										X	X								X
			Microvelia dubia				X															
		Pleidae	*Neoplea halei*																			

Table 2 continued. Macroinvertebrates recorded from streams on King Island. Total number of species recorded also shown.

			Stream :	Seal R			Fraser R		Yellow Rock R		Pass R		Porky ck		Ettrick R	Grassy R	Sea Elephant R		Yarra Ck		Egg Lagoon Ck	
			Habitat :	Edge	Mid	Wood	Edge	Mid	Mid	Edge	Mid	Edge	Edge	Mid	Mid	Mid	Edge	Mid	Mid	Edge	Mid	Edge
Class	Order	Family	Species																			
Insecta	Trichoptera	Atriplectidae	*Atriplectides dubius*									X			X							
		Hydropsychidae	*Asmicridea sp AV1*												X							
		Leptoceridae	*Condocerus paludosus*																	X		
			Lectrides varians				X															
			Notalina spira								X	X		X			X	X				
			Notalina fulva												X							
			Notalina sp. AV2																			
			Oecetis sp.																			
			Symphitoneuria opposita								X	X	X	X			X	X		X	X	
			Triplectides proximus								XX	XX			X							
			Triplectides similis				X	X														
			Triplectides australis																			
			Triplectidina nigricornis	X	X		XX	XX													X	
			Triaenodes sp.	X																		
		Kokiriidae	*Taskiria sp.*				X															
		Conoesucidae	*Lingora aurata*								X	X			XX							
			Costora sp.delora?												XX							
		Hydrobiosidae	*Taschorema evansi*												X	XX						
			Taschorema																			
			Tanjilana zothecula												X	X						
			Ptychbiosis sp AV3				X															
		Hydroptilidae	*Hellyethira simplex*												X							
		Ecnomidae	*Ecnomus cygnitus*										X					X				
		Tasimiidae	*Tasimia sp AV1*												X							
	Coleoptera	Adult Dytiscidae	*Allodessus bistrigatus*							X												
			Antiporus femoralis																			
			Hyderodes shuckhardi																			
			Gibbidessus chipi																			
			Lancetes lanceolatus												X							
			Liodessus amabilis																			
			Liodessus gemellus							X				X								
			Megaporus hamatus										X									
			Necterosoma penicillatus										X						X		X	
			Necterosoma undecimlineatum														X			X		
			Sternopriscus tasmanicus																			
			Sternopriscus maedfooti																			
		Larvae Dytiscidae	*Hyderodes shuckhardi*			X							X									
			Necterosoma sp.										X									
			Megaporus sp.																			
			Lancetes lanceolatus																			
			Antiporus sp.																			
			Rhantus suturalis																		X	
			Sternopriscus sp.																			
		Hydrophilidae	*Berosus duplopunctatus*							X												
			Berosus discolor							X												
			Berosus majusculus							X												
			Limnoxenus zelandicus							X												X
			Enochrus sp.																			X
			Paranacaena sp.																			X
		Larval hydrophilidae	*Berosus sp.*																			
			Enochrus sp.	X																		X
			Limnoxenus zelandicus	X																		
		Hydrochidae	*Hydrochus sp.*																	X		
		Elmid adults	*Austrolimnius sp.*												X							
			Simsonia sp.												X							
		Elmid larvae	*Austrolimnius sp.*												X							
			Notriolus quadriplagiatus								X				X							
			Simsonia leai												X							
			Simsonia tasmanica												X							
		Scirtidae		X		X										X				X		
	Diptera	Chironominae		X	XX	X		X	X	X	X	XX	X	X	X	XX	XX	XX	X	X	X	X
		Orthocladiinae						X			X				X	X						
		Tanypodinae					X	X		X	X	X	X	X	X	X	X	X	XX	X		
		Diamesinae				XX				X												
		Simuliidae		X	XX		X				X	X			X	XX		XX			X	X
		Tipulidae		X			X				X			X	X	X		X			X	
		Dixidae										X				X						
		Chaoboridae																				
		Ceratopogonidae			X	X			X						X	X				X		
		Culicidae				X																
		Podonominae						X														X
Number of Species observed				**16**	**19**	**11**	**15**	**12**	**16**	**28**	**19**	**22**	**24**	**24**	**27**	**17**	**11**	**14**	**9**	**15**	**16**	**18**

Table 3. Macroinvertebrates recorded from wetlands on King Island. XXX, XX and X = taxon represents > 50%, 25% or 10% of total abundance. Data from winter 2002 kick net samples (live picked) from mid channel and edge habitats.

		Wetland :	Colliers Swamp	Berties Lagoon		Bobs Lagoon		Pearshape Lagoon		Lilly Lagoon		Nook Swamp		Swan Lagoon	
		Habitat :	Midwater	Edge	Midwater	Edge	Midwater	Edge	Midwater	Edge	Midwater	Edge	Midwater	Edge	Midwater
Order/Class	Family	Species													
Gastropoda	Hydrobiidae	*Potamopyrgus antipodarum*							X						
	Planorbidae	*Glyptophysa gibbosa*				X	X		X				XX		
	Physidae	*Physa acuta*				X	XX	X			X				
Turbellaria						X			X						
Oligochaeta												X			X
Bivalvia	Sphaeriidae	*Ptisidium casertanum*							X						
		Sphariium tasmanicum						X							
Cladocera	Daphniidae	*Daphnia sp.*							X	X	XXX				
		Scapholebris kingi		XX	X										
		Simocephalus sp.					X					X	XX		
	Chydoridae	*Chydorid spp.*				XX			X						
Ostracoda		*Ostracod spp.*				X				X		X			
Copepoda		*Copepod spp.*			XX	X	X		X						
Amphipoda	Ceinidae	*Austrochiltonia dalhousiensis*						XX	XX						
		Austrochiltonia australis	X			XXX	XX	X	X	XX	XX	XX	XX	XX	XXX
	Paramelitidae	Unidentified sightless species								X	X			XX	X
	Paracalliopidae	*Paracalliope vicinus*	X												
Isopoda	Janiridae	*Heterias sp.*	XX	X	X					X				X	X
Syncarida	Koonungidae	*Koonunga sp.*		X	X										XX
Decapoda	Hymenosomatidae	*Amarinus lacustris*							X						
	Parastacidae	*Geocharax gracilis*		X	X								X		X
Hydracarina	Elyidae					X		X					XX		
	Hydryphantidae					X	X	X				XX			
	Pionid								X	X	X	X			
	Unidentified					X		X	X						
	Lycosid spiders													X	X
Ephemeroptera	Leptophlebiidae	*Nousia sp av7*													X
		Nousia sp . Unid (too small)								X					
Odonata	Coenagrionidae	*Ischnura heterosticta tasmanica*						X							
	Lestidae	*Austrolestes analis*				X							X		
		Austrolestes annulosus								X					
		Austrolestes psyche					X	X				X			
Hemiptera	Corixiidae	*Sigara australis*						X	X		X				
		Sigara neboissi			X								X		
		Micronecta annae tasmanica								X					X
		Unidentified corixiid nymphs						X	XX		X				
	Notonectidae	*Anisops deani*													X
		Anisops tasmaniensis					X	X		X	X		X	X	X
	Naucoridae	*Naucoris congrex*					X								
	Pleidae	*Neoplea halei*					X							X	
Trichoptera	Leptoceridae	*Notalina sp. AV2*						X	X						
		Oecetis sp.							X						X
		Symphitoneuria opposita					X	X	X	X	X			X	X
		Triplectides australis								X					
		Triplectidina nigricornis		X											
Coleoptera	Adult Dytiscidae	*Allodessus bistrigatus*			XX										
		Antiporus femoralis		X	X						X				
		Hyderodes shuckhardi											X		
		Gibbidessus chipi		XX											
		Lancetes lanceolatus								X					
		Liodessus gemellus		X								X			
		Megaporus hamatus								X					
		Sternopriscus tasmanicus				X									
		Sternopriscus maedfooti		XX	X					X	X				
	Larval Dytiscidae	*Hyderodes shuckhardi*	X			X	X			X	X	X	X		
		Megaporus sp.					X								
		Lancetes lanceolatus								X					
		Antiporus sp.		X	XX										
		Sternopriscus sp.			X							X		XX	
	Adult Hydrophilidae	*Berosus duplopunctatus*								X					
		Limnoxenus zelandicus				X						X			
		Enochrus sp.										X	X		
	Larval hydrophilidae	*Berosus sp.*													X
Diptera	Chironominae		XXX	X	X			X		XX	X	X	X		
	Orthocladiinae				X										
	Tanypodinae		X	X	X			X	X	X	XX			X	
	Diamesinae			X								X			
	Chaoboridae			X	X										
	Ceratopogonidae		X												
	Culicidae			XX	XX							X			
	Podonominae					X		X							
Number of species :		**By habitat**	**7**	**15**	**16**	**15**	**13**	**17**	**18**	**20**	**14**	**15**	**12**	**9**	**14**
		Total		**20**		**22**		**27**		**24**		**22**		**17**	

Fish Species descriptions

Short-finned eel (*Anguilla australis*)

Description: A native species. The short-finned eel is an elongate and cylindrical/tubular fish species. Its dorsal, anal and caudal fins are continuous forming one inseparable fin containing no spines. Pelvic fins are absent, but small ovate pectoral fins are present just behind small vertical gill openings. The skin is slimy with small indistinct scales deeply embedded. The species has a large mouth extending to below the eyes, with nostrils that are long and protrude above the upper lip. Refer plate eight.

Colour: Short-finned eels have a uniform colouration, but this colour can vary from olive-green through brown to black on the dorsal side with a lighter greyish white ventral surface. Mature migratory adults often have a very dark dorsal surface with an easily distinguishable silver belly. The juvenile glass-eel stage is transparent and unpigmented on arrival into freshwater, but soon develop a uniform brown-black colouration.

Size: Generally, males are smaller than females. Females can reach lengths of over 1100mm and weigh upwards of 3kg, however, more commonly they are around 50cm and 0.5 kg.

Preferred Habitat: The short-finned eel is found in freshwater lakes, swamps and streams, preferring still water that is often turbid. This species is often associated with deep pools that contain areas of cover, such as weed beds and/or woody debris. The spawning run, the final stage of the life cycle is spent in oceanic waters.

Natural History: Short-finned eels are native to Tasmania, King and Flinders island as well as south-eastern mainland Australia and New Zealand. Its widespread and common occurring in a wide variety of wetland habitats, from rivers and creeks to lakes and swamps. It is essentially a still water species.

The glass eel stage is about 60mm in length when they migrate in from the sea into estuaries during March to November. Once in brackish or freshwater, they develop pigmentation and enter the elver stage of its lifecycle. The elvers then penetrate into the upper reaches of waterways. Eels can take between 15 to 30 years to mature. When mature, they then migrate downstream to the sea to spawn and die. It is thought that spawning occurs at great depth in the Coral Sea. Larval eels, known as *leptocephali* (because of their willow leaf shape) are carried back from the spawning grounds via the ocean currents and the lifecycle begins over again.

King Island Distribution: Due to the ability of the species to penetrate into all reaches of swamps and streams it is able to move across moist ground. The species is present in the majority of freshwater habitats on the island. King Island supports a commercial fishery for the short-finned eels and periodic restocking of the species occurs using elvers harvested from mainland Tasmanian waters.

King Island Conservation Status: The short-finned eel remains abundant across its entire range, although numbers may have declined due to commercial fishing of both the feeding and migratory stages.

Utility: As a recreational angling species it provides good sport as it is considered as a hard fighting fish. It is also enjoyed as a food by some. It is easily caught on rod and line and will readily take most bait. A recreational angling licence is required. It also is caught in unbaited fyke nets by commercial fishers.

Special Management Considerations: The species is managed for both its commercial value and its recreational angling qualities. The species is abundant and widespread throughout its entire range and as a result requires no special management considerations.

Other names: Is also known as silver eel, which refers to the colouration of the migratory adults.

Climbing galaxias (*Galaxias brevipinnis*)

Description: A native species. This species is the largest of the Australian galaxiids. It has an elongate body with an almost tubular trunk. As with all the galaxiid species an adipose fin and body scales are absent. Its head is dorsally flattened, containing a large mouth with the lower jaw distinctly shorter than the upper. Its mouth reaches well below the eyes and large lateral canine teeth are present. The fins are thick and fleshy particularly at their base, anal fin origin behind the dorsal fin origin. Both pelvic and pectoral fins are large and round. A distinctive dark blotch immediately above the pectoral fin base is evident. Refer plate four.

Colour: The species has a highly variable pattern of markings, from bold bands to irregular patches and blotches. The general colour is greyish brown to dark olive, darker on the back and becoming lighter on the sides and belly. The stomach area is usually a dull silvery olive. Gold iridescence is often apparent on the back and sides in bright sunlight.

Size: This species is known to reach 280 mm in length, but more commonly ranges from 150-170 mm.

Preferred Habitat: The climbing galaxias is a secretive and solitary species that prefers clear flowing streams with rocky substrates. Can also be found landlocked in some lake systems across its range. Often found in the upper reaches of streams above natural barriers to other fish species, however can be found down to sea level in streams that do not contain introduced species such as trout. Swims near the bottom usually near the cover of rocks and logs.

Natural History: This species has both landlocked and riverine populations. In riverine populations spawning takes place in autumn. The exact site is unknown, however eggs have been found among litter of the forest floor beyond the normal limits of stream flow, presumably spawned there during times of flood. The eggs can number from several hundred to many thousand (upto 23, 000 have been reported). The newly hatched larvae are thought to be swept downstream where there is a marine stage of about 5–6 months before the juvenile fish return to freshwater in spring as part of the whitebait runs. Landlocked populations breed in spring and schools of juvenile fish are seen in lake margins during late summer.

The climbing galaxias is an aggressive upstream migrant. It is well known for its ability to climb moist surfaces of waterfalls and other barriers and can penetrate the upper limits of stream systems. It adheres to damp rock surfaces with its fleshy pectoral and pelvic fins and wriggles upwards using lizard like movements.

King Island Distribution: In surveys conducted on King Island in 2001, the species was recorded in only one location, above the gauging weir in the Ettrick River. Past surveys have however recorded the climbing galaxias in the Yellow Rock River. It is possible the species still occurs in the larger streams on King Island, although in low numbers.

King Island Conservation Status: Given the limited distribution of the species on the island, both historically and in recent surveys, it appears that the climbing galaxias is restricted to pockets of suitable habitat in a small number of streams. The distribution has almost certainly been reduced following the historical clearing of forests on King Island and the channelisation of streams.

Utility: The species forms part of the annual whitebait migration. A recreational whitebait fishery does not currently exist for on King Island, as the biomass of fish is

small. This species also adds to the native biodiversity of fish on King Island and its aesthetic value is also of importance.
Special Management Considerations: There are no special management guidelines in place for the King Island population. Its range and abundance is limited, but this can only be improved by restoring stream riparian zones, water quality and instream habitat.
Other names: Known as koaro in New Zealand.

Spotted galaxias (*Galaxias truttaceus*)

Description: A native species. The spotted galaxias is a stout-bodied fish with a deep belly, large head and mouth. As with all the galaxiid species an adipose fin and body scales are absent. The jaws are of equal length and the mouth reaches back to the front of its eyes with no lateral canine teeth present. The fins are large, with the anal and dorsal fins distinctly rounded and the anal fin origin directly below the dorsal fin origin. The tail is slightly forked. Refer plate two.
Colour: Colouration of this species is variable, depending on habitat. Regular small spots with surrounding lighter halos are evident, but the number and pattern of these spots is variable. General body colour is brownish to deep olive, paling to brownish grey on the sides and silvery on the belly. Fins are generally brown to olive with the dorsal, anal and caudal fins appearing golden to bright orange in colour with a dark outer edging. A distinctive diagonal dark stripe is always present passing back downwards through the eyes, and two blue-black blotches are present above the pectoral fins origin. Juveniles have a barred pattern rather than spots.
Size: A large galaxiid that can reach sizes over 200 mm, but more commonly 120 – 140 mm.
Preferred Habitat: The species is commonly associated with plants, rocks and logs on the margins of streams and lake systems. It is most common at lower elevations often remaining near the coast.
Natural History: The species has both riverine and landlocked populations, each with a different breeding time. The riverine populations breed in autumn-winter, with the exact location unknown. The resulting larvae are washed out to the coast where they return some months later as part of the whitebait run. Landlocked populations spawn among aquatic vegetation during spring and the larvae are found around the lake margins throughout summer. The eggs are approximately 1.3 mm in diameter and number between 1000 and 16000 in adult females. The spotted galaxias is a carnivorous species, feeding opportunistically on a wide range of terrestrial and aquatic invertebrates.
King Island Distribution: During surveys conducted on King Island in 2001, the species was recorded in one location only, below the gauging weir in the Ettrick River. Past surveys have however recorded the spotted galaxias in the Grassy River. It is possible the species still occurs in the larger streams on King Island, although in low numbers.
King Island Conservation Status: Given the limited distribution of the species on the island, both historically and in recent surveys, it appears that the spotted galaxias is restricted to pockets of suitable habitat in a small number of streams. The distribution has almost certainly been reduced following the historical clearing of forests on King Island and the channelisation of streams.
Utility: The species forms part of the annual whitebait migration. A recreational whitebait fishery does not currently exist for on King Island, as the biomass of fish is small. However if habitats could be restored and the annual migration nurtured, a

whitebait fishery could be considered in future. This species also adds to the native biodiversity of fish on King Island and its aesthetic value is also of importance.
Special Management Considerations: There are no special management guidelines in place for the King Island population. Its range and abundance is limited, but this can only be improved by restoring stream riparian zones, water quality and instream habitat.
Other names: Can be known as mountain trout, spotted mountain trout or mountain minnow.

Australian grayling (*Prototroctes maraena*)

Description: A native species. A slender elongate species that is laterally flattened. It has a small head with a bluntly rounded snout and large eyes. It has a small-based dorsal fin on the middle of its back originating just behind the level of the pelvic fins. A small adipose fin is present and the tail fin is deeply forked. A weak, horny abdominal keel can be felt in front of the anal vent. The species also has a distinctive cucumber odour when caught, a characteristic it shares with a closely related family member, the Tasmanian smelt. The body is covered in cycloid scales of moderate size, which are easy dislodged when handled.
Colour: The Australian grayling is generally dark green to grey along the back, silvery along the sides with a white belly. Colouration can vary slightly depending on maturity. A dark mid-lateral streak is usually present and effectively divides the pigmentation pattern of the back and sides. The fins are grey in colour, but can be almost transparent along the outer edges.
Size: The species has been reported to reach a maximum size of about 300 mm, however they are more commonly 170 - 180 mm in length.
Preferred Habitat: The species appears to prefer clear, moderate to fast-flowing rivers and streams, often in the upper reaches of catchments. Typically found in gravel-bottom pools. Often seen in schools below barriers to upstream movement, such as weirs, waterfalls or log jams.
Natural History: The Australian grayling is a shy species that flees when disturbed. It spawns in autumn probably during the months of April and May, however spawning requirements are unknown. Males mature sexually at one year of age and the females in their second year. They are thought to commonly live for about three years, however specimens estimated at five years of age have been recorded. On hatching the larvae are about 4.5mm long and are phototropic; this means they are attracted to the sunlight and are washed downstream as a result. The larvae then have a marine stage and return to the rivers in spring when they are about 6 months old.
The Australian grayling is an opportunistic omnivore, feeding on a mixed diet of algae and both aquatic and terrestrial invertebrates. Its intestine has a double loop, which is rare in salmoniform species. This almost certainly allows additional time for the digestion of algae and the absorption of plant material.
King Island Distribution: During surveys conducted on King Island in 2001, the species was not recorded. Historical survey information however, has recorded it (only once), below the gauging weir in the Ettrick River.
King Island Conservation Status: Australian grayling abundance has declined across its entire range (southeastern mainland Australia and coastal Tasmania). The reasons for this decline are unclear. A second grayling species in New Zealand has also declined and is now thought to be extinct. On King Island the fact that the species has only ever been recorded once, suggests that it is either an occasional wayward

migrant swept by the marine currents during its larval stage, or it may have vanished from the island altogether.

Utility: The Australian grayling was once a very popular angling species, especially before numbers began to decline. Its numbers are such now that it is protected in all Australian waters. This species also adds to the native biodiversity of fish on King Island (if still present) and its aesthetic value is also of importance.

Special Management Considerations: The Australian grayling is fully protected under State and Commonwealth threatened species legislation and the Tasmanian *Inland Fisheries Act 1995*. It is prohibited to take or disturb the species. However, there has been little public education and enforcement to support the legislation. It should be considered that this species still exists on King Island. Any activities involving the use or manipulation of suitable habitat should consider the impacts that these actions may have on this and other species.

Other names: Also known as cucumber herring or cucumber mullet.

Common jollytail (*Galaxias maculatus*)

Description: A native species. The common jollytail is a slender-bodied galaxiid, with a small head that is bluntly pointed and containing large eyes. The mouth is small reaching back to the front of the eyes with equal length jaws, which lack canine teeth. The fins are thin and membranous with dorsal and anal fins rounded and set posteriorly. The tail is distinctively forked. Refer plate three.

Colour: The species translucent olive-green on the back and upper sides, with a variable combination of small dark bars and spots on the sides. The belly, gill covers and eyes are distinctive silver and a greenish sheen is usually apparent above a silver belly.

Size: May reach 190 mm, but more commonly less than 100mm.

Preferred Habitat: The species can be found in a wide variety of habitats, but is most common in gently flowing waters of streams, rivers and in lakes at lower elevations. It has an amazing tolerance to salinity, being capable of surviving salinities of 49 parts per thousand (seawater is about 35 p.p.t).

Natural History: Adult fish migrate downstream in autumn and breed in estuarine marshes. Eggs are deposited on marginal vegetation during spring tides and the eggs hatch on the next, or a subsequent, spring tide and the larvae are taken to sea. The larvae remain at sea for about 4-5 months and return to freshwater as a major part of the whitebait run in spring. The freshwater stage of the lifecycle inhabits the lower reaches of coastal streams and can also form landlocked populations in farm dams and coastal lagoons. Fish usually mature at one year of age but some can take as long as three years to reach sexual maturity. The common galaxias is a carnivorous species, feeding opportunistically on a wide range of terrestrial and aquatic invertebrates.

King Island Distribution: The common jollytail is widespread on King Island. It can be found throughout Lavinia Nature Reserve and all of its associated waterways including Nook swamps, Egg Lagoon Creek and the myriad of drains that run into this area. All of the swamps and coastal lagoons in the south of the island, including Big Lake, Shearing Shed Lagoon, Denbys Lagoon, Colliers Swamp and Woodland Lagoon also appear to contain the common jollytail. In addition the majority of coastal streams, rivers and drains as well as any lagoons that are periodically connected to coastal drainages may also contain populations.

King Island Conservation Status: The species is considered as very common on the island. This is due to its tolerance of salinity and periodic increases in nutrient load. Its abundance does not appear to be in a state of decline.

Utility: The species forms part of the annual whitebait migration. A recreational whitebait fishery does not currently exist for on King Island, as the biomass of fish is small. However if habitats could be restored and the annual migration nurtured, a whitebait fishery could be considered in future. This species also adds to the native biodiversity of fish on King Island and its aesthetic value is also of importance.
Special Management Considerations: There are no special management guidelines in place for the King Island population. Its range and abundance appear to be healthy and stable, therefore no special management is required.
Other names: Known as Inanga in New Zealand, and as puyen in Chile and Argentina. Also often referred to as the common galaxias or spotted minnow.

Southern Pygmy perch (*Nannoperca australis*)

Description: A native species. The southern pygmy perch is a small-scaled fish that is laterally compressed. Its body depth is variable but is usually more than 30% of the fish length. It has a small mouth that extends back to just below the eye which does not contain canine teeth. Its dorsal fin is deeply notched, with the entire anterior portion containing spines. The lateral line is divided into two distinct portions and the body is covered in small ctenoid scales. Refer plate five.
Colour: Colouration is highly variable, depending on water clarity and geographical range. The base colour varies from pale cream to brownish green on the top and fading to white or silver on the belly. Irregular dark brown blotches are often evident along the sides of the fish, interspersed with hints of red which are more obvious in males. The fins are clear or dusky in appearance, with breeding males developing darkened fins with reddish tinges during the breeding season.
Size: Largest specimen known is 85 mm, but normally only grows to 65 mm total length.
Preferred Habitat: The species inhabits vegetated margins of streams, billabongs, drains, dams and swamps, in still or gently flowing water.
Natural History: The species is thought to be a protracted or multiple spawner, breeding between September and January. Several hundred eggs are randomly scattered on aquatic vegetation, which hatch in around three days. Females grow larger than males, although the males grow faster in the first few years of life. Most fish in a population are either 1 or 2 years old, although fish can live for more than 5 years. Both sexes mature in their fist year and the males become highly territorial during the breeding season. Their diet consists of small crustaceans, insects and their own larvae.
King Island Distribution: The southern pygmy perch is widespread on King Island. During surveys conducted in 2001 the species was recorded throughout Lavinia Nature Reserve and Nook Swamp. It was also located in several small water bodies that drain into Lake Flannigan, although not in the lake itself. It is possible that this species is in Lake Flannigan, although if a report of trout within the lake is correct, it may have been removed through predation.
King Island Conservation Status: The species is considered to be common on the island and does not appear to be in a state of decline.
Utility: The southern pygmy perch is thought to play an important role in mosquito control in drains, dams and waterways across its range. It also adds to the native biodiversity of fish on King Island and its aesthetic value is also of importance. In the past it has been utilised as an attractive aquarium species, but a permit to posses freshwater fish is required from the Tasmanian Inland Fisheries Service.

Special Management Considerations: There are no special management guidelines in place for the King Island population. Its range and population status appear to be healthy and stable and therefore requires no special management.

Freshwater Flathead or Sandy (*Pseudaphritis urvilli*)

Description: A native species. The freshwater flathead is an elongate and cylindrical fish, distinguishable by the flattened head, pointed snout and eyes positioned near the top of the head. The lower jaw is longer than the upper, and both jaws are lined with bands of small teeth. First dorsal fin origin is well behind the head, second dorsal fin is long and low. Anal fin origin is below last rays of the first dorsal fin and resembles the second dorsal fin in shape and length. Head and body are covered with moderate-sized ctenoid scales.

Colour: The species is variable in colour depending on the substrate of the area it inhabits. Usually whitish overall, dusky-green to reddish-brown dorsally, with an irregular series of dark brown blotches on the sides. Undersurface white to yellow. Its fins are transparent, except for faint spotting on the tail and dorsal fins. Refer plate one.

Size: Attains lengths of 340 mm, but mostly about 100 – 150 mm.

Preferred Habitat: A bottom-dwelling species of brackish estuaries, but also inhabiting slow-flowing freshwater systems sometimes many kilometres inland from the coast. Usually found around logs, aquatic plants, leaf litter and undercut banks.

Natural History: The freshwater flathead is equally at home in either fresh or salt water. The spawning site is unknown but it does not appear to be in freshwater. Juveniles are most abundant in the lower reaches of rivers during spring and summer, while larger specimens are generally more common upstream. It is likely that the freshwater flathead lives to at least five years of age. Its diet consists of insect larvae, worms, small crustaceans and other fish.

King Island Distribution: This species can be found in the lower reaches of all the main rivers on King Island. It has also be found in several of the small coastal creek systems that contain permanent water. Recent surveys in 2001 did not locate this species in the Nook Swamp area of King Island, although this habitat appears to be suitable.

King Island Conservation Status: The species is considered to be common on the island and does not appear to be in a state of decline.

Utility: Although excellent eating, this species is usually too small to be utilised as a table fish. It is usually only caught by recreational anglers and is of no commercial importance. It adds to the native biodiversity of fish on King Island and its aesthetic value is also of importance.

Special Management Considerations: There are no special management guidelines in place for the King Island population. Its range and population status appear to be healthy and stable and therefore requires no special management.

Other names: The species is known as a tupong in Victoria, but also is commonly known as a flathead, sand trout, marble fish, sandy, congolli and roach in various locations where it exists.

Brown trout (*Salmo trutta*)

Description: An introduced species. The salmonidae family is characterised by a dorsal fin high on the back and further forward than the pelvic fins, an adipose fin, small scales, a lateral line and axillary processes on the pelvic fins. Brown trout are

generally a thick-bodied fish with a big head and a mouth that extends back below the eyes. Eyes are moderately large although they appear smaller with increased body growth. Its tail is slightly forked, if at all. Refer plate six.

Colour: Colouration of the brown trout is highly variable depending on habitat and life history. Sea-run specimens are silvery and somewhat olive on the back, with indistinct dark spots on the sides. Lake fish also tend to be silvery in general colour but the spots on the fishes sides can vary from red to brown-black. River fish are often much darker than lake or sea-run specimens and are usually more distinctly marked, often with darker spots above the lateral line and bright red or pale brown spots surrounded by halos below the lateral line.

Size: Can reach at least 1400 mm (fork length) and weigh more than 20kg, is known to reach at least 900 mm and 14kg in Australia.

Preferred Habitat: This species is one of Australia's most well-adapted freshwater fish introductions. It can and does survive in a wide range of habitats from small streams to brackish marshes and freshwater lake systems. Prefers deep cool and well-oxygenated water with cover from avian predators (ie weed beds, over-hanging vegetation, under-cut banks etc.) and easy access to feeding areas.

Natural History: This species is native to Europe, from Iceland and Scandinavia south to Spain and Northern Africa, and eastwards to the Black and Caspian Seas. It was introduced into Australia in the 1860's and has spread by a combination of stocking and migration and now forms self-sustaining populations in many areas in southern and eastern Australia.

Brown trout spawn in autumn and winter (April-August) in rivers and streams with gravel substrates. Spawning fish often migrate upstream into feeder streams and tributaries with gravel beds but may spawn locally in a river or on a lake shore if gravel is present and there is sufficient water movement to oxygenate the eggs. The eggs take several weeks to develop depending on water temperature. The young larvae (alevins) remain in the gravel for some time after hatching until they absorb their yolk sack. After emerging from the gravel beds (redds) they begin feeding and form shoals in slow flowing water or around lake margins.

Brown trout is predatory in nature and feed on a wide variety of animals – aquatic crustaceans, molluscs, insects and small fishes, as well as terrestrial organisms that fall into the water.

King Island Distribution: Since 1995 the Inland Fisheries Service has stocked brown trout into several waterbodies on King Island. Waters include Lake Wickham, Penny's Lagoon and Cask Lake. It is possible that brown trout exist outside these lakes from illegal introductions and/or escapees forming small populations within streams. Recent surveys in 2001 did not locate this species in any streams. However, previous records show the species exists in several areas.

King Island Conservation Status: This species is introduced to King Island and stocked into several lakes as a recreational fish species. It has no conservation status, however size and bag limits exist for the taking of the species and an angling licence is required. Its presence may have negative impacts on native macroinvertebrate and fish species.

Utility: Brown trout are a very popular recreational angling species and are managed solely for this purpose.

Special Management Considerations: An angling licence is required to take this species and minimum size and bag limits apply.

Other names: Often called sea trout or Englishman.

Rainbow trout (*Oncorhynchus mykiss*)

Description: An introduced species. Resembles brown trout in most features, but rather deeper bodied and more laterally compressed. Refer plate seven.

Colour: Colouration of the rainbow trout is variable depending on habitat and life history. Lake fish are predominantly silvery, with dark olive to steely-blue backs and many small dark spots on the sides. Often a rosy pink stripe is evident along the sides and on the gill covers. River fish and those on spawning migrations are more distinctly marked, with the pink stripe appearing intense, often-deep crimson in colour. Spots on the sides are bolder and more conspicuous.

Size: Maximum size of about 1120 mm and >20 kg in weight, although in Australia they have been recorded 780 mm in length and weighing 8 kg.

Preferred Habitat: This species prefers lakes, but also inhabits streams in cool (10-22 degrees), well-oxygenated water typically over gravel bottoms.

Natural History: Life history is similar to that of brown trout. This species does have a wider temperature tolerance than brown trout, but appears to be much better adapted to lakes than river systems. Rainbow trout spawn later than brown trout, during winter to early spring (August – October). The eggs are smaller and faster developing than brown trout. Brown and rainbow trout often coexist together although brown trout usually dominate.

King Island Distribution: The species has been recorded in several lake systems on King Island, although stockings by the Inland Fisheries Service have not occurred since 1995. An illegal hatchery carrying rainbow trout was discovered on King Island in early 2000. It is unclear if fry and fingerlings from this hatchery were used to illegally stock farm dams or lake systems of the island.

King Island Conservation Status: The species has been introduced to King Island and stocked into several lakes as a recreational fish species. It has no conservation status, however size and bag limits exist for the taking of this species and a licence is required in order to fish.

Utility: Rainbow trout are a very popular recreational angling species and are managed solely for this purpose.

Special Management Considerations: An angling licence is required to take this species and minimum size and bag limits apply.

Other names: Often known as a Steelhead.

Identification of fish

The following sources are strongly recommended:

Allen G.R., Midgley S.H., Allen M. (2002) "Field guide to the freshwater fishes of Australia" CSIRO Publishing, Victoria.

Fulton W., (1990). "Tasmanian Freshwater Fishes" Fauna of Tasmania handbook no. 7. University of Tasmania, Hobart.

McDowall R.M., (1996). "Freshwater Fishes of south-eastern Australia." Reed Books. Chatswood, New South Wales.

Identification of macroinvertebrates

The macroinvertebrates are too diverse and numerous to be comprehensively covered here. A handy guide to freshwater macroinvertebrates has been written by John Gooderham and Edward Tsyrlin, 'The Waterbug Book' (CSIRO Publishing 2002). Identification of macroinvertebrates to species level is often a specialist job, requiring a microscope and keys, many of which are listed in the Waterbug book. We recommend getting familiar with the main orders and families first before venturing further.

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Images

PLATE: 1
Freshwater flathead (*Pseudaphritis urvillii*)
Photo: B. Mawbey

PLATE: 5
Southern
Pygmy perch (*Nannoperca australis*)
Photo: R. Mawbey

PLATE: 2

Spotted galaxias (*Galaxias truttaceus*)

Photo: B. Mawbey

PLATE: 6
Brown trout (*Salmo trutta*)
Photo: Inland Fisheries Service

PLATE: 3
Common galaxias (*Galaxias maculatus*)
Photo: B. Mawbey

PLATE: 7
Rainbow trout (*Oncorhynchus mykiss*)
Photo: Inland Fisheries Service

PLATE: 4
Climbing galaxias (*Galaxias brevipinnis*)
Photo: J. Jackson

PLATE: 8
Short-finned eel (*Anguilla australis*)
Photo: Inland Fisheries Service